

On the occurrence of *Microphilypnus* (Myers 1927; Gobiiformes, Eleotridae) in BoliviaSobre la ocurrencia de *Microphilypnus* (Myers 1927; Gobiiformes, Eleotridae) en Bolivia

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Species of the eleotrid genus *Microphilypnus* Myers 1927 belong to the smallest neotropical fish (Caires & de Figueiredo 2011). Their distribution range include the Amazon, Orinoco, and Paraguay basins. Issued proofs are known from Brazil, Colombia, Paraguay, and Venezuela. This report expands the known distribution range into the eastern part of the Bolivian Iténez drainage and reinforces an old unpublished report from the head waters of Río Baures (N° 9, Table 1), Beni. It is the first published occurrence, including exact location data and biotope descriptions as well as water parameters, of this genus for Bolivia.

In this report, *Microphilypnus* is regarded as a member of Eleotridae, following recent classifications and studies (Nelson *et al.* 2016, Betancur *et al.* 2017, Guimarães-Costa *et al.* 2017) that list Eleotridae as a valid family. Some publications though list the genus in the subfamily Eleotrinae, which again they include in Gobiidae (Thacker 2009). *Microphilypnus* spp. reach up to 27 mm TL and can be identified by a combination of the following characteristics: < 3 cm, first dorsal fin with 6 spines, second dorsal fin with 1 spine and 5 - 9 rays, anal fin with 5 - 9 rays, pectoral fins with 11 to 15 rays, 21 - 32 ctenoid scales on lateral rows, translucent base colour or pale with irregular markings (Van der Sleen & Albert 2018). According to Caires & Toledo-Piza (2018) and Fricke *et al.* (2022) the genus *Microphilypnus* currently holds five nominal species. These are *M. acanguara* Caires & Figueiredo 2011, with type locality at Río Tapajós, near São Luis, Amazonas, Brazil; *M. hypolyrasimeion* Caires & Toledo-Piza 2018, at Igarapé do Maiuxi, Rio Negro, Amazonas, Brazil; *M. macrostoma* Myers 1927, at Rio Negro, Igarapé da Mai Joana, Amazonas, Brazil; *M. tapajosensis* Caires 2013, at Río Tapajós, near São Luis, Amazonas, Brazil; and *M. ternetzi* Myers 1927, at Caño de Quiribana near Caicara, Bolívar, Venezuela.

In the checklist of freshwater species of South and Central America, Kullander (2003) does not list any representative of Gobiiformes for Bolivia. Lauzanne *et al.* (1991), Ibisch & Mérida (2004) as well as Sarmiento & Barrera (2004) list an unidentified *Eleotridae* sp. as the sole member of Gobiiformes for Bolivia. The two latter don't provide any additional information about the origin, but are probably based on the former. Thacker *et al.* (2006) are the first to mention preserved specimens of the genus for Bolivia at the University of Michigan Museum of Zoology (UMMZ) and provide a location (Río Iténez basin, Beni, Bolivia). Unfortunately, one of the deposited origins for the specimens Thacker *et al.* (2006) referred to UMMZ 209803, is not located in Bolivia, but in Brazil. A second one (UMMZ 204333) comes with unclear GPS-coordinates and a non-specific description of where the samples were collected. Likely based on that information, Sarmiento *et al.* (2014) list an unidentified *Microphilypnus* sp., but do not provide pictures or more detailed information either. However, the UMMZ holds preserved specimens of the genus *Microphilypnus*, that date back to 1964 and 1986 (Table 1).

The briefly reflected history of the order and the genus shows how poorly understood and overlooked this group of fish is in Bolivia. This note is the first to include life pictures (Figure 1A, 1B) and exact locality data with a description of the biotopes inhabited by the only known member of the genus in Bolivia.

**Table 1.** Preserved *Microphilypnus* Myers 1927 in the ichthyological collection of the University of Michigan Museum of Zoology (UMMZ), marked with the origin “Bolivia”.

N°	Code	Scientific name	GPS-coordinates <sup>1</sup>	Origin	year
1	UMMZ 204244	<i>Microphilypnus</i> sp.	-12.4916667 -64.2583333	Río Iténez, Beni, Bolivia	1964
2	UMMZ 204267 <sup>2</sup>	<i>Microphilypnus</i> sp.	-12.4733333 -64.2766667	Río Iténez, Rondônia, Brazil	1964
3	UMMZ 204318	<i>Microphilypnus</i> sp.	-12.4916667 -64.2566667	Río Iténez, Beni, Bolivia	1964
4	UMMZ 204333 <sup>3</sup>	<i>Microphilypnus</i> sp.	not known	possibly Bolivia	1964
5	UMMZ 204355	<i>Microphilypnus</i> sp.	-12.4950000 -64.2483333	Río Iténez, Beni, Bolivia	1964
6	UMMZ 204392	<i>Microphilypnus</i> sp.	-12.5166667 -64.3166667	Río Iténez, Beni, Bolivia	1964
7	UMMZ 204531	<i>Microphilypnus</i> sp.	-12.5400000 -64.2116667	Río Iténez, Beni, Bolivia	1964
8	UMMZ 209803 <sup>4</sup>	<i>Microphilypnus</i> sp.	-12.2333333 -64.2116667	possibly Brazil	1964
9	UF 81911 <sup>5</sup>	<i>Microphilypnus</i> sp.	-13.2833333 -63.5666667	Río San Martin, Beni, Bolivia	1986

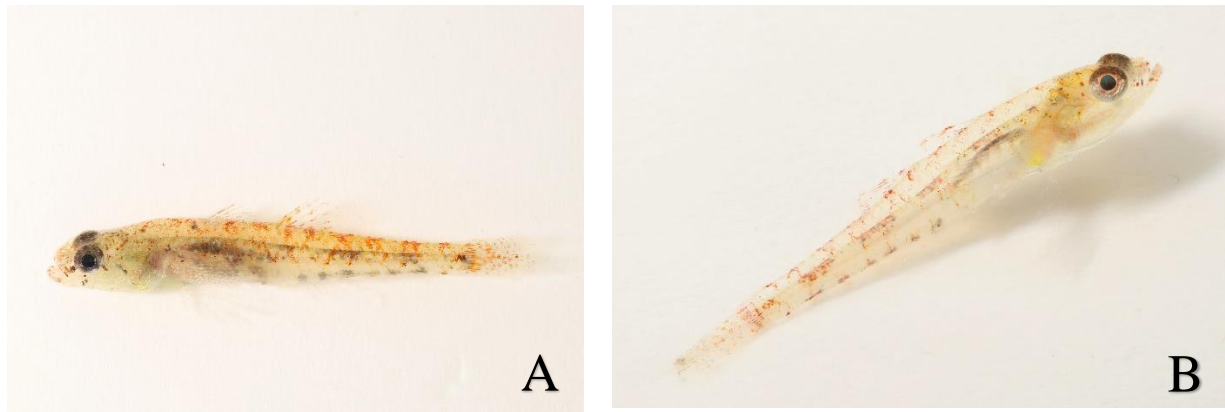
<sup>1</sup>Taken from fishnet2.net and fms02.lsa.umich.edu/fmi/webd/ummz\_fish (accessed the 16<sup>th</sup> of August 2022)

<sup>2</sup>UMMZ 204267 is listed for the country of Bolivia, but the GPS-coordinates, as well as the locality description (“Isolated lagoon (ox-bow of Rio Iténez), 0.4 mi SW of River opp Costa Marques, Brazil; Iténez-Mamore-Madeira-Amazon dr”) are leading to a lagoon northward of the river, Brazil.

<sup>3</sup>UMMZ 204333 is referred to as originating from Bolivia by Thacker *et al.* (2006). The digital catalogue of the University of Michigan Museum of Zoology does not provide any GPS-coordinates and only refers to the location as described by the collectors. (“Ox-bow lagoon 3 km SW of Costa Marques, Brazil; Itenez - Mamore - Madeira)

<sup>4</sup>UMMZ 209803 is listed for the country of Bolivia, but the GPS-coordinates lead to a field 24 km in the north of Costa Marques, Brazil. The locality description (“Pond in arroyo below lower campo of Pampa de Meio, ca 12 km SE Costa Marques, Brazil; Iténez - Mamore - Amazon dr”) does not match the coordinates.

<sup>5</sup>UF 81911 (Florida Museum of Natural History) is said to originate from “Río San Martin 13 km E of Bella Vista”. The provided GPS-coordinates do not show a body of water on today’s maps, and lead to a location 2 km northwards of the Río San Martin, Bolivia. Given technical inaccuracies and changes in the tributaries and riverbed since 1986 this is an acceptable imprecision.



**Figura 1.** A) *Microphilypnus* cf. *ternetzi* originating from Río Curicha, a blackwater tributary of Río Iténez. B) *Microphilypnus* cf. *ternetzi* originating from Río Baures, a white-water tributary of Río Iténez. © Daniel M. Konn-Vetterlein.

Due to official restrictions during the survey realized in 2018, it was not possible to preserve any of the collected specimens, therefore no measurements could be taken, and no meristic data are available for this report. Both recorded locations, as detailed below, belong to the Madeira River drainage, it can therefore be suspected that the individuals collected either represent *Microphilypnus acangaquara* or *M. ternetzi*, as they are the only known species of the genus from named drainage. Van der Sleen & Albert (2018) list *M. acangaquara* as possibly distributed in the Aripuanã River (middle Madeira basin) and *M. ternetzi* as being distributed in all Amazonas tributaries, the Orinoco and Paraguay basins. Caires & de Figueiredo (2011) list one specimen (MCP 38871) of *M. ternetzi* from the Rio da Lage (Brazil, Rondônia, Rio Madeira basin, 10°26'00" S, 65°20'40" W), close to the Bolivian border, around 280 km respectively 350 km linear distance northward of the locations discussed in this report.

**Río Baures** (-13.243253, -63.719389; elevation of 140,7 m): The fish were collected close to the right bank of the river, on a sandy substrate, between fallen leaves and branches (Figure 2A). The water level was between 20 and 65 cm high. They were easy to catch if one made sure to use the net close to the ground. Observations under water showed that *Microphilypnus* cf. *ternetzi* do not flee over long distances. In fact, they mainly rely on their translucent body colour and blur into their surrounding area. Specimens were observed laying on the ground, leaning on their pectoral fins, very similar to *Characidium* spp. At this location the species was abundant and easy to catch. The following water parameters were taken at the collection site: 21  $\mu\text{S}/\text{cm}$ ; 25,1°C; pH 5-5,5.

**Río Curicha** (-12.521792, -63.894594; elevation of 155 m): Like at the collection site in Río Baures, *Microphilypnus* cf. *ternetzi* was abundant at this location on the right bank of the river, where the water level was only a few centimetres high (1 to 20 cm), and leaves covered part of the sandy substrate (Figure 2B). No specimens were collected at the opposing riverbank, where the water level was much higher and the substrate more of a muddy type with large branches and roots covering the bottom. The following water parameters were taken at the collection site: 26  $\mu\text{S}/\text{cm}$ ; 26,7 °C; pH 4-4,5.



**Figure 2.** A) Location of Río Baures (23.08.2018; 12:00 hrs), 3,3 km north of Bella Vista; B) Location of Río Curicha (29.08.2018; 15:00 hrs) at 3,4 km from Río Iténez. C) The team of “SiluCha Bolivia 2018” collecting *Microphilypnus* cf. *ternetzi*. © Daniel M. Konn-Vetterlein.

## FINAL CONSIDERATIONS

Even though this is one of the closest reported locations, it has to be mentioned that natural barriers in form of rapids are present over this distance, which might affect a dispersion of the genus, respectively interject population ranges. Following the key provided by Caires & Toledo-Piza (2018) and the known distribution range of *M. ternetzi* it is thought that the individuals collected during our expedition are representatives of the same. It cannot be precluded though that they represent an undescribed species. Hence it is important to fund and organize more faunal surveys into this and other regions of Bolivia, to achieve a better overview of the aquatic diversity of this mega diverse country, which is among the 15 richest countries in the world in terms of biodiversity with high levels of the same, but also deficient information for a decent general overview (Ibisch & Merida 2004, Fernández *et al.* 2015).

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